

ANTIPOV-KARATAYEV, I.N., akademik, otv.red.; TYURIN, I.V., glavnyy red.;
GORBUNOV, N.I., red.; VERIGINA, K.V., red.; ZONN, S.V., red.;
IVANOVA, Ye.N., red.; KEDROV-ZIKHEMAN, O.K., red.; KONONOVA,
M.M., red.; LOBOVA, Ye.V., red.; MISEUSTIN, Ye.N., red.; RODE,
A.A., red.; ROZANOV, A.N., red.; SOKOLOV, A.V., red.; FRIDLAND,
V.M., red.; SHUVALOV, S.A., red.; YEFIMOV, A.L., red.izd-va;
MAKUNI, Ye.V., tekhn.red.

[Reports of Soviet soil scientists to the 7th International
Congress in the U.S.A.] Doklady sovetskikh pochvovedov k VII
Mezhdunarodnomu kongressu v SSHA. Moskva, Izd-vo Akad.nauk SSSR,
1960. 487 p. (MIRA 13:10)

1. International Congress of Soil Science. 7th. 2. AN Tadzhik-
skoy SSR (for Antipov-Karatayev). 3. Pochvennyy institut im. V.V.
Dokuchayeva Akademii nauk SSSR, Moskva (for Antipov-Karatayev, Gorbunov,
(Continued on next card)

706049
MISHUSTIN, Yevgeniy Nikolayevich, prof., doktor biolog. nauk; TRISVIAT-
SKIY, Lev Alekseyevich, prof., doktor tekhn. nauk; VYSOTSKAYA,
R.S., red.; FEDOSOVA, N.I., red.; SAVEL'YEVA, Z.A., tekhn.red.

[Microbiology of grain and flour] Mikrobiologiya zerna i muki.
Moskva, Izd-vo tekhn.i ekon. lit-ry po voprosam khleboproduktov,
1960. 406 p. (MIRA 14:5)

1. Chlen-korrespondent AN SSSR (for Mishustin)
(Grain) (Flour) (Microbiology)

GOL'DIN, M.I., doktor biolog.nauk. Prinimals uchastiye DANILOVA, L.V.,
kand.biolog.nauk. MISHUSTIN, Ye.N., doktor biolog.nauk,
nauchnyy red.; GUREVICH, Z.S., red.; YUSPINA, M.L., tekhn.red.

[In the world of invisible beings; album] V mire nevidimyykh;
al'bom. Sostavlen M.I.Gol'dinym pri uchastii L.V.Danilovoi.
Nauchn.red. E.N.Mishustin. Moskva, Izd-vo "Sovetskaya Rossiya,"
1960. 40 plates (in portfolio). (MIRA 13:12)

1. Chlen-korrespondent AN SSSR (for Mishustin).
(MICROBIOLOGY--PICTORIAL WORKS)

MISHUSTIN, Ye.N.

Microbiological research in the United Arab Republic. Mikrobiologiya
28 no.4:615-622 Jl-Ag '59. (MIRA 12:12)
(EGYPT--MICROBIOLOGICAL RESEARCH)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700047-6

MISHUSTIN, Ye.N.

Biological sciences in the United Arab Republic. Izv.AN SSSR.
Ser.biol. no.4:612-620 J1-Ag '59. (MIRA 12:9)
(UNITED ARAB REPUBLIC--BIOLOGY)

MISHUSTIN, Ye.N.

Microbiological methods of improving the feed supply. Izv. AN
SSSR. Ser. biol. no. 4:510-521 J1-Ag '59. (MIRA 12:9)

1. Institute of Microbiology, Academy of Sciences of the
U.S.S.R., Moscow.
(FEEDS) (BACTERIOLOGY, AGRICULTURAL)

AL'F, S.L.; MISHUSTIN, Ye.N.; PERTSOVSKAYA, M.I.; KHLBNIKOV, N.I.;
SYSIN, A.N., prof., red.; URAZATEV, B.M., red.; BUL'DYATEV,
N.A., tekhn.red.

[Indications of the sanitary condition of the soil of populated
places] Pokazateli sanitarnogo sostoiania pochvy naselennykh
mest. Pod red. A.N.Sysina. Moskva, Gos.izd-vo med.lit-ry, 1959.
149 p. (MIRA 13:5)

1. Deystvitel'nyy chlen AMN SSSR (for Sysin).
(SOILS--BACTERIOLOGY)

MISHUSTIN, Ye. N.

"The theory of the microbe associations of the soil".

report presented at a Joint Session of the Biological Dept. of AN USSR and Biological and Medical Depts. AN Gruzija SSR, Tbilisi, 28 Sept - 3 Oct 1957. Vestnik Akad. Nauk SSSR, 1958, V. 28, No. 1, pp. 121-125. (author Daidzishvili, M. N.)

MISHUSTIN, Ya.N.

Boris Lavrent'evich Isachenko. Mikrobiologiya 27 no.6:760-762
N-D '58. (MIRA 12:1)
(ISACHENKO, BORIS LAVREN'EVICH, 1871-1948)

MISHUSTIN, Ye.N.

Symposium on microbiological methods of soil research held in
Belgium (June 3-6, 1957). Mikrobiologiya 27 no.1:137-140 Jan-F '58.
(HEVERLEE, BELGIUM--SOIL RESEARCH--CONGRESSES) (MIRA 11:4)

Soil Cultivation and Harvest

SOV-26-58-9-4/42

of the layer of grass sods was studied by L.P. Belyakova and I.N. Antipov-Karatayev in 1954 and under the direction of the latter in the grey earth of the Vakhshskaya pochvenno-meliorativnaya stantsiya im. V.V. Kuybysheva (Vakhshskaya Soil Melioration Station imeni V.V. Kuybyshev). The problem of annual plants in soil cultivation was studied by P.G. Aderikhin and Ye.N. Titova. There is 1 photo, 1 drawing, 6 tables and 9 Soviet references.

ASSOCIATION: Institute mikrobiologii AN SSSR/Moskva (The Institute of Microbiology of the AS USSR/Moscow)

1. Agriculture--USSR 2. Soils

Card 2/2

SOV-26-58-9-4/42

AUTHOR: Mishustin, Ye.N., Member Correspondent, AS USSR
 TITLE: Soil Cultivation and Harvest (Obrabotka pochvy i urozhay)
 PERIODICAL: Priroda, 1958, Nr 9, pp 25-32 (USSR)

ABSTRACT: According to a project worked out by the XXth Congress of the Soviet CP, the gross grain harvest is to be 11 billion poods by 1960. One of the unquestionable prime factors is soil cultivation, especially ploughing. Breaking up of the virgin soils in the east of the USSR has demonstrated that the yield of the soil increases with cultivation, i.e. maximum harvests are not obtained from untouched soil. This was also proven in practice on the dark-brown soil of the "Komsomol'skiy" sovkhos in the Akmolinsk Oblast. New suggestions with respect to ploughing depth and the upper soil layer were made by V.P. Bushinskiy, V.P. Mosolov and other researchers. K.I. Boltan, I.V. Matyshuk and other researchers were concerned with the investigation of the organic remains in the soil. The distribution of the root systems in the soil were studied by P.A. Genkel', V.A. Frantsesson, I.V. Matyshuk and other investigators. Ye.G. Petrov showed that deep ploughing yielded increased harvests in steppe soils. Deep ploughing

Card 1/2

MISHUSTIN, Ye. N., Mbr. of the AS USSR

"Soil Microorganisms."

scientific report presented at the Plenary Meeting of the Department of
Biological Sciences, Acad. Sci. USSR, 16-17 June 1958
(Vest. AN SSSR, 1958, No. 8, pp. 97-60)

MISHUSTIN, Ye.N.

The geographical factor and distribution of soil micro-organisms
[with summary in English]. Izv. AN SSSR, Ser. biol. no. 6:661-676
N-D '58 (MIRA 11:11)

1. Microbiological Institute, Academy of Sciences of the U.S.S.R.,
Moscow.

(SOIL MICRO-ORGANISMS)

MISHUSTIN, Ye.N.

The theory of soil microbe associations and its development.
Trudy.Inst. mikrobiol. no.5:116-127 '58 (MIRA 11:6)

1. Institut mikrobiologii AN SSSR.
(SOIL, microbiology,
microbial assoc., review (Rus))
(MICROORGANISMS,
in soil, microbial assoc., review(Rus))

ZUBRILIN, A.A.; MISHUSTIN, Ye.N.

[Ensilage of fodder; theory] Silosovanie kormov (teoriia voprosa).
Moskva, Akademiia nauk SSSR, 1958. 224 p. (MIRA 12:4)
(Ensilage)

GAUZE, Georgiy Frantsevich; MISHUSTIN, Ye.N., otv.red.; ANTONYUK, L.D.,
red.izd-va; NOVICHKOVA, N.D., ~~tekhn.red.~~

[Ways of searching for new antibiotics] Puti izyskaniia novykh
antibiotikov. Moskva, Izd-vo Akad. nauk SSSR, 1958. 171 p.
(MIRA 12:1)

1. Chlen-korrespondent AN SSSR (for Mishustin).
(ANTIBIOTICS)

MISHUSTIN, Yevgeniy Nikolayevich; USPENSKAYA, N.V., red.; BERLOV, A.P.,
tekh. red.

[Achievements of Soviet biology] Dostizhenia sovetskoi biologii.
Moskva, Izd-vo "Znanie," 1958. 62 p. (Vsesoiuznoe obshchestvo po
rasprostraneniu politicheskikh i nauchnykh znani. Ser. 9, vyp. 1,
no.11/12). (MIRA 11:8)

1. Chlen-korrespondent Akademii nauk SSSR (for Mishustin).
(BIOLOGY)

MISHUSTIN, YE. V.

MISHUSTIN, Ye. N.; RUNOV, Ye. V. (Moskva)

Successes in developing the principles underlying a microbiological
diagnosis of soil conditions. Usp. sov. biol. 44 no. 2: 256-268 S-O '57.
(SOIL MICRO-ORGANISMS) (MIRA 10:12)
(SOILS--ANALYSIS)

MISHUSTIN, Ye.N.

Soviet agricultural microbiology and its achievements. Mikrobiologiya
26 no.6:673-684 H-D '57. (MIRA 11:3)
(BACTERIOLOGY, AGRICULTURAL)

MISHUSTIN, Ye.N.; TEMLYAKOVA, Z.F.

Virgin lands and characteristics of their microflora. Izv. AN Kazakh,
SSR. Ser. biol. no.12:5-19 '57 (MIRA 10:4)
(KAZAKHSTAN--SOIL MICRO-ORGANISMS)

MISHUSTIN, YE.N.
MISHUSTIN, Ye.N.

Achievements in soil microbiology. Pochvovedenie no.11:62-79
N 157. (MIRA 10:12)
(Soil micro-organisms)

USSR / Soil Science. Biology of Soils.

J-3

Abs Jour : Ref. Zhur - Biologiya, No 17, 1958, No. 77396

Author : Mishustin, Ye. N.; Mirzoyeva, V. A.; Vostrov, I. S.

Inst : Shadrin Experimental Station AS USSR

Title : Influence of Cultivation of Chernozem Soil by the
T. S. Mal'tsev Method on Its Microflora and Biodynamics

Orig Pub : Izv. AN SSSR, ser. biol., 1957, No 4, 466-479

Abstract : The biological activity of chernozems cultivated at a depth of 50 cm and of the same soils cultivated by the usual method at a depth of 25-30 cm was compared at the Shadrin Experimental Station (1953-1956). Samples were taken of soils that were in a fallow state and of those occupied by crops of spring wheat and vetch-oat mixture. It is shown that deep nonbanking cultivation of the soil activates the course of the microbiological processes in the soil. Conditions are created for the development of

Card 1/2

MISHUSTIN, YEVGENIY-NIKOLAYEVICH

KOZ'MINA, Natal'ya Petrovna, doktor biol.nauk, prof.; KUPRITS, Yakov Nikolayevich, doktor tekhn.nauk, prof.; MISHUSTIN, Yevgeniy Nikolayevich, doktor biol.nauk, prof.; POD'YAPOL'SKAYA, Ol'ga Petrovna, kand.tekhn.nauk; KHUSID, Semen Davidovich, doktor tekhn.nauk; GEL'MAN, D.Ya., red.; GOLUBKOVA, L.A., tekhn.red.

[Development of grain science in the U.S.S.R.; a collection of articles] Razvitie nauki o zerne v SSSR; sbornik statei. Pod red. N.P.Koz'minai. Moskva, Izd-vo tekhn.i ekon. lit-ry po voprosam mukomol'no-krupianoi i kombikormovoi promyshl. i elevatorno-skladskogo khoziaistva, 1957. 129 p. (MIRA 11:7)

1. Chlen-korrespondent AN SSSR (for Mishustin)
(Grain)

MISHUSTIN, Yevgeniy Nikolayevich; USPENSKAYA, N.V., red.; GUBIN, M.I.,
tekhn.red.

[Role of microorganisms in increasing productivity in agriculture
and stockbreeding] Rol' mikroorganizmov v povyshenii produktivnosti
zemledeliia i zhivotnovodstva. Moskva, Izd-vo "Znanie," 1957. 39 p.
(Vsesoiuznoe obshchestvo po rasprostraneniia politicheskikh i
nauchnykh znani. Ser.8, no.45) (MIRA 11:4)

1. Chlen-korrespondent AN SSSR (for Mishustin)
(Bacteriology, Agricultural)

MISHUSTIN, Ye.N.

Microbiology in the Chinese People's Republic. Priroda 45 no.5:
71-73 My '56. (MLRA 9:8)

1. Chlen-korrespondent Akademii nauk SSSR.
(China--Microbiology)

MISHUSTIN, Ye.N.

Conference on the use of antibiotics in agriculture (U.S.A.) Usp.
sovr.biol. 41 no.2:250-258 Mr-Apr '56. (MLA 9:8)
(ANTIBIOTICS) (AGRICULTURE)

MISHUSTIN, Ye.N.

Conference on the use of antibiotics in agriculture (U.S.A.).
Mikrobiologiya 25 no.3:386-389 MyOJe '56. (MLRA 9:10)
(WASHINGTON--ANTIBIOTICS--CONGRESSES)

ILLEGIBLE

ILLEGIBLE

ILLEGIBLE

Mishustin, E.N.

Category: USSR/General Division. Scientific Institutions.

A-3

Abs Jour: Referat Zb.-Biol., No 9, 30 May 1957, 34911

Author : Mishustin, E.N.

Inst : not given

Title : Microbiology in the Chinese Peoples Republic

Orig Pub: Priroda, 1956, No 5, 71-73

Abstracts: No abstract.

Card : 1/1

-4-

MISHUSTIN, Ye. N.

"Study of the Microbial Associations in Soils," a paper presented at the 6th International Soil Science Congress, Paris, 28 Aug to 8 Sep 56.

In Library Branch #5

MISHUSTIN, Ye.N.; SMIRNOVA, K.M., redaktor; SOMOROV, B.A., tekhnicheskiy
redaktor

[Microorganisms and fertile soils] Mikroorganizmy i plodorodie
pochvy. Moskva, Izd-vo Akademii nauk SSSR, 1956. 246 p.
(Micro-organisms, Nitrogen-fixing) (MLRA 9:3)

GOL'DIN, Mark Iosifovich; MISHUSTIN, Ye.N., doktor biologicheskikh nauk,
nauchnyy redaktor; GOLUBKOVA, V.A., redaktor; YUSFINA, N.L., te-
khnichekiy redaktor

[Microbes around us] Mikroby vokrug nas. Moskva, Gos. kul'turosvet-
izdat, 1956. 15 p.
(MLFA 10:4)

1. Chlen-korrespondent Akademii nauk SSSR (for Mishustin)
(Micro-organisms)

MISHUSTIN, E.N.
CZECHOSLOVAKIA/Soil Science - Biology of Soils.

J.

Abs Jour : Ref Zhur - Biol., No 15, 1958, 67932

Author : Misustin, E.N.

Inst : Czechoslovakian Agricultural Academy.

Title : Soil Microbiology in the Service of High Yields.

Orig Pub : Sbor. Ceskosl. akad. zemed. ved. Rostl. vyroba, 1955,
28, No 3-4, 165-174.

Abstract : No abstract.

Card 1/1

MISHUSTIN, Ye.N.

Work of scientific research institutions of the Chinese People's
Republic in the field of microbiology. Mikrobiologiya 24 no.6:
744-748 N-D '55. (MLRA 9:4)

(CHINA--MICROBIOLOGY)

MISHUSTIN, Ye.N.

Bacterial associations in soils and methods for studying them.

Mikrobiologiya 24 no.4:474-485 J1-Ag '55 (MLRA 8:11)

(SOIL,

bacteriology, review)

(BACTERIA,

soil, review)

MISHUSTIN, Ye.N.

Through scientific institutions of the German Democratic Republic.
Mikrobiologiya 24 no.2:254-257 Mr-Apr '55. (MIRA 8:7)
(GERMANY, EAST--MICROBIOLOGY)

Mishustin V.N.
DROBOT'KO, V.G.

"Micro-organisms and soil self-purification" by E.N. Mishustin and
M.I. Pertsovskaia. Reviewed by V.H. Drobot'ko. Mikrobiol.
zhur. 17 no.2:67-68 '55 (MLRA 10:5)
(SOIL MICRO-ORGANISMS) (MISHUSTIN, E.N.) (PERTSOVSKAIA, M.I.)

MISHUSTIN, Ye. N.

MD Secretion of isochlorogenic acid by alfalfa and their effect on
 cotton and soil microflora. Ye. N. Mishustin and A. N.
 Naumova. *Izv. Akad. Nauk SSSR Ser. Biol.* 1968,
 No. 8, 8-9. During the vegetative period the root system
 of alfalfa excretes into the soil quantities of isochlorogenic acid
 contained in the roots. Excretion of this plant for 3-4 years in
 the same field raises the isochlorogenic acid in the soil to the
 point at which the growth of cotton plants on the plot is
 seriously retarded. Grain yields are not sensitive to
 isochlorogenic acid. Most soil microflora are suppressed
 by this isochlorogenic acid, thus causing a lowering of biogenic po-
 tential of the soil. The glucosides, thus accumulated in the
 soil, repress the growth of *Mutisomyces melleosporus*, a
 phytoparasite which attacks cotton. G. M. E.

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FD-2389

USSR/Agriculture - Plant Ecology

Card 1/1

Pub. 42-2/9

Author : Mishustin, Ye. N., Petrova, A. N., Karashchuk, I. M.

Title : ~~THE EPYPHYTE MICROFLORA OF ESPARSETTE SEEDS AND INCREASING ITS YIELD~~
The epiphyte microflora of esparsette seeds and increasing its yield

Periodical : Izv. AN SSSR. Ser. Biol. 2, 8-18, March-April, 1955

Abstract : In addition to the usual epiphyte microflora such as Bact. herbicola, Pseudomonas etc., the Alternaria tennis fungus, considered semiparasitic by the authors, lowers the rate of germination of esparsette, weakens its growth and decreases its yield. The effect of two fungicides, TMTDS and INJIF-2 or granozan, was investigated and granozan found to be more effective against this fungus. However, best results against Alternaria are obtained by a treatment of seeds with the fungicide. Photographs; tables. Nine references, all USSR (all after 1940).

Institution: Institute of Microbiology Acad Sci USSR and the Institute of Farming of the Central Chernozem Belt imeni V. V. Dokuchayev.

Submitted : November 20, 1954

MISHUSTIN, E.N. Member-Correspondent of the USSR Academy of Sciences

"Microorganisms and fertile soils"

Report given at jubilee held on June 20-21, 1955 in honor of 25th anniversary of foundation of Inst of Microbiology, AS USSR

MISHUSTIN, E. N.

USSR/Biology - Bacteriology

Card 1/1 : Pub. 86 - 7/46

Authors : Mishustin, E. N., Mem. Corres. Ac. Sci.; and Gilyarov, M. S.

Title : Microbiology of the soil in Czechoslovakia

Periodical : Priroda, 43/9, 52-55, Sep 1954

Abstract : The article deals with a convention that was held in Czechoslovakia in February of 1954, which was attended by 120 delegates and at which 50 papers were read pertaining to microorganisms that are in some way connected with agriculture, either as plant parasites or in the form of edaphon. No definite scientific information is revealed.

Institution :

Submitted :

MISHUSTIN, E. N.

USSR/ Scientific Organization - Conferences

Card 1/1 : Pub. 86 - 8/40

Authors : Mishustin, E. N., and Iyerusa...dy, N. D.

Title : At the International Congress of Microbiologists in Rome

Periodical : Priroda 43/4, 64-68, Apr 1954

Abstract : An account is given mainly of the sight-seeing and social features of the biological congress in Rome. It is noted, however, from papers read that outside of the Soviet Union the action of anti-biotic substances is studied mainly from the viewpoint of curing diseases, overlooking their application in the industrial preservation of food.

Institution :

Submitted :

ITYERUSALIMSKIY, N.D.; MISHUSTIN, Ye.N.

Results of the Rome Congress of Microbiologists. Usp.sovr.biol.
37 no.1:127-132 Ja-F '54. (MLRA 7:2)
(Rome---Microbiology---Congresses) (Congresses---Microbiology---Rome)

MISHUSTIN, Ye.N. (Moscow).

Law of zonality and theory of microbial soil associations. Usp.
sovr.biol.37 no.1:1-21 Ja-F '54. (MLRA 7:2)
(Soil microorganisms)

MISHUSTIN, Ye.N.

Conference on soil microbiology in Czechoslovakia. Vest. AN
SSSR 24 no.8:64-68 Ag '54. (MLRA 7:9)

1. Chlen-korrespondent Akademii nauk.
(Czechoslovakia--Soil microorganisms) (Soil microorga-
nisms--Czechoslovakia)

MISHUSTIN, Ye.M.

Conference on soil microbiology held in Czechoslovakia on Feb.
22-24, 1954. Mikrobiologiya 23 no.4:516-520 J1-Ag '54. (MLRA 7:9)
(CZECHOSLOVAKIA--MICROBIOLOGY)
(MICROBIOLOGY--CZECHOSLOVAKIA)

MISHUSTIN, Ye.N.

"Microbiology of cellulose." A.A.Imshenetskii. Reviewed by E.N.
Mishustin. Mikrobiologiya 23 no.2:228-230 Mr-Apr '54. (MLRA 7:4)
(Microbiology) (Cellulose) (Imshenetskii, A.A.)

MISHUSTIN, Ye.N.; IERUSALIMSKIY, N.D.

Sixth International Congress of Microbiologists in Rome. (MLRA 7:2)
Mikrobiologiya 23 no.1:125-128 Ja-F '54.
(Microbiology--Congresses)

MISHUSTIN, E. N.

USSR/Biology - Microbiology

Card 1/1 : Pub. 124 - 8/38

Authors : Mishustin, E. N., Memb. Corresp. of Acad. of Sc. USSR

Title : Conference in Czechoslovakia on the microbiology of the soil

Periodical : Vest. AN SSSR 8, 64-68, Aug 1954

Abstract : Report by the Soviet delegate on the conference on soil microbiology, held at the Academy of Agricultural Sciences of Czechoslovakia in February 1954

Institution :

Submitted :

MISHUSTIN, Ye N.

MISHUSTIN, Ye N.

Ecologo-geographic distribution of Azotobacter in soils in U.S.S.R.
Trudy Inst. mikrobiol. no.3:81-97 '54. (MIRA 6:3)
(SOIL, bacteriology,
Azotobacter)
(AZOTOBACTER,
in soil)

MISHUSTIN, Ya. N.; PERTSOVSKAYA, M. I.; IMSHENETSKIY, A. A., redaktor;
RAKITSKIY, N. P., redaktor; MOSKVICHEVA, N. I., tekhnicheskii re-
daktor.

[Microorganisms and self-purification of the soil] Mikroorganizmy i
samoochishchenie pochvy. Moskva, Izd-vo Akademii nauk SSSR, 1954. 650 p.
(MLRA 8:2)

1. Chlen-korrespondent AN SSSR (for Imshenetskiy).
(Soil microorganisms)

MISHUSTIN, E. N.

B. T. R.
Vol. 3 No. 4
Apr. 1954
Agriculture

(1)

4362* Microorganisms and Soil Fertility. (Russian) E. N. Mishustin. *Prirada*, v. 42, no. 10, Oct. 1953, p. 24-32. Discusses beneficial and harmful microorganisms. Describes preparations which activate microbiological processes. Graph, diagram, photographs, micrographs.

MISHUSTIN, Ye.N., professor.

The microbiological factor in the development of plants and the problem of
productivity. Vest. AN SSSR 23 no.4:30-42 Apr '53. (MLA 6:6)
(Botany--Physiology) (Microorganisms)

MISHUSTIN, Ye.N.

Occurrence of Azotobacter in soils. Mikrobiologiya 22 no.4:498-514 July-Aug
'53. (MLR 6:3)

1. Institut mikrobiologii Akademii nauk SSSR, Moscow.
(Soil microorganisms)

MISHUSTIN, E.N., and KONOVA, M.M.

Problem of soil humus and contemporary tasks of its study.

Microbiologiya. Vol. 22. No. 3, P. 344, 1953.

MILITARY

USSR

Microorganisms and cell facility. E. N. Minsin, A. T. G. K. in Vopr. Pochvennoi Mikrobiol., Akad. Nauk, S.S.S.R., Inst. Mikrobiol. 1963, 7-82. A review with 27 references. G. T. G.

MISHUSTIN. YE. N

USSR 600

Soils

Scientific principles governing soil processes (Results of the conference on
problems of soil microbiology) Priroda 41 no. 3, 1952

9. Monthly List of Russian Accessions, Library of Congress, July 1977. Unclassified.
2

MISHUSTIN, YE. N.

Agriculture

Joint scientific session of the Academy of Sciences of U.S.S.R. and of the Academies of Sciences of the Estonian, Latvian and Lithuanian S.S. Republics on problems of biology and agriculture. Mikrobiologiya 21 no. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, July 1952. UNCLASSIFIED.

MISHKIN, YE. N.

Microorganisms

Dokuchayev, Kostychev, Vill'ias and soil microbiology., Vest. AN SSSR, 21, no. 12, 1961.

Monthly List of Russian Accessions, Library of Congress, May 1952. UNCLASSIFIED.

USSR/Biology (Agriculture) - Microbiology Oct 51

"Soil Microbiology and Its Current Tasks," Ye. N. Mishustin

"Trudy Inst Mikrobiol" No 1, pp 155-175

Discusses soil microbiology in connection with the planting of forest shelter belts, microbiol aspects of V. R. Vil'yams's system of agriculture, the tasks of microbiology in connection with the regulation of nutrition and fertilization of agricultural plants (mentioning the use of azotogen which contains azobacter, nitrogen, phosphobacterin, a bacterial prepri than decomposes silicates, the prepri AKB which activates soil biodynamics), 209TS

USSR/Biology (Agriculture) - Microbiology Oct 51 (Contd)

analysis of the activity of microorganisms in connection with tilling and irrigation of the soil, microbiol methods of diagnosing the condition of the soil. Says that it is impossible to use the same bacterial nitrogen fertilizer throughout the USSR: Azobacter does not survive in steppe regions during dry weather.

209TS

MISHUSTIN, Ye. N.

B.A.

AIII-25

Vegetable zone of mountainous regions and its relation to the bacterial composition of the soil. E. N. Mishustin and V. A. Mirzoeva (*Microbiology*, 1960, 18, 299-307).—An investigation was made of the relative numbers of spore-bearing organisms in the soil in different mountainous regions in both virgin and cultivated land. The results are discussed in relation to similar previous work of the authors on lowland soils. Study of soil flora may give valuable information about other properties of the soil. D. H. SMYTH.

CA

15

The Dokuchaev-Kostychev-Vilyams soil doctrines and
problems of microbiological participation in plant growth
B. N. Mishustin (Acad. Sci., Moscow). *Mikrobiologiya*
10, 11-23 (1950). 25 references. Julian P. Smith

No. 1

ILLEGIBLE

MISHUSTIN, Ye.N.

Environment and variability of microorganisms. Gg. sanit., Moskva
(CLML 19:4)
No.5:5-12 May 50.

25

13TR

1857. *Termofilnye Mikroorganizmy v Prirode i Praktike.*
(*Thermophilic Micro-Organisms in Nature and Practice.*) E.
N. Mishustin. 391 pages. 1950. Academy of Sciences of the
USSR, Moscow and Leningrad. U.S.S.R. (QB53 M684)
Discusses the nature and possible utilization of thermophilic
bacteria, i.e., microorganisms which are able to grow even at
very high temperatures. Applications in the fermenting industry,
in purifying spring waters, in disposal of city sewage, in treat-
ment of organic manures, in food processing, etc., are described
in detail. Lengthy bibliography is presented first in Russian
then in English.

CA

11C

Mycorrhiza on woody plants and its significance in protective reforestation. E. N. Mishustin and O. I. Pushkinskaya (Acad. Sci., Moscow). *Mikrobiologiya* 18, 447-47(1949).—A study of organisms forming useful symbiotic growths on tree roots, their relations to carbohydrate absorption and other aspects of tree nutrition, and their utility in promoting growth of forest seedlings. 75 references.

No. 5

Julian F. Smith

CA

No. 1

15

Changes in soil microflora resulting from prolonged use of fertilizers. E. N. Mishustin and V. N. Prokoshin. *Mikrobiologiya* 18, 30-41 (1949). Prolonged use of inorg. fertilizers in crop rotation (without grassland intervals) greatly increases concn. of reactive alumina, lowers pH, lowers concn. of bases and lessens crop yields. Soil cell counts decrease as to actinomycetes and nonspore formers, but increase as to bacilli and fungi. Lime alleviates these drawbacks somewhat. Spore formers may increase, though some (e.g. *Bacillus mycoides*) are likely to decrease. Nitrifiers decrease and soil nitrification drops. Cellulolytic fungi and myxobacteria increase. The large increase in microbial activity caused by manure is a major factor in the crop increase which follows. Nitrifiers, fungi, bacteria, actinomycetes, thermophiles, *Bacillus mesentericus*, and (with heavy applications of manure) cytophaga are conspicuous sharers in the activity rise. Even with optimum use of manure, lime, and inorg. fertilizers, crop-rotation cycles should include grassland. Julian F. Smith

ASH S.A. METALLURGICAL LITERATURE CLASSIFICATION

PA 59/49742

MISHUSTIN, YE. N.

USSR/Medicine - Literature Jan/Feb 49
 Medicine - Microbiology

Review of M. V. Fedorov's "Biological Fixation of Atmospheric Nitrogen," Ye. N. Mishustin, 4 pp
 "Microbiol" Vol XVIII, No 1
 Published by OGIZ-Sel'khozgiz in 1948. Valuable because it presents original Soviet research in this field. Actual value of publication is limited in that it presents only the chemical processes which occurred in the fixation experiments. Section which refers to practical data includes very concise. Recommends that future data include

59/49742

USSR/Medicine - Literature (Contd) Jan/Feb 49
 a wider treatment of this subject with more practical examples.

59/49742

MISFUSTIN, Ye. N.

1871

1871

Pamyati Akademika Boris Lavrent, evicha Isachenko. (Vikrobitelov. ~~XX~~-1948) Letop.
Zhurnal, 1949, No. 5, s547-51 s. 547-51.

SO: Letopis' Zhurnal'nykh Stetov, Vol. 48, Moskva, 1949

MISHUSTIN, YE. A.

71 50/4979

USSR/Academy of Sciences
Biological Sciences

May 49

"Proceedings in the Department of Biological
Sciences" 2 pp

"Vest Ak Nauk SSSR" No 5

Describes development of irrigation in central black
soil belt, and summarizes work of Ye. A. Mishustin,
Dr Biol Sci, on microbiological analysis of fertile
soils, showing that microorganisms, like plants,
vary with different zones.

50/4979

MISHUSTIN, YE. N.

"Laws of Zonality and Composition of the Bacteria Population in Soils," Trudy Yubileynoy Sessii, posvyashch stoletiyu so dnya pozhdeniya Dokuchayeva M-L., 1949, pp. 102-09.

"Academician Boris Lavrent'yevich Isachenko," (Microbiologist, 1871-1948, Necrology), Pochvovedeniye, No. 3, 1949, pp. 183-84, and in Botan. Zhur., Vol. 34, No. 5, 1949.

"Variations in the Composition of Soil Microflora as a result of Prolonged use of Fertilizers," with V. N. Prokoshev, in Mikrobiologiya No. 1, 1949, pp 30-41.

MISHUSTIN, YE. N.

in soil serve as indication of trans-
formation process. Submitted 15 Dec 47.

USSR/Medicine - Soil, Bacteriology May/Jun 48
(Contd)

Role of these bacteria is undecided. Mishustin quotes
series of observations showing that they are connected
with the transformation of relatively inactive forms
of organic soil residue which can be regarded as
samples peculiar to the particular soil. There-
fore, type and numbers of spore-forming bacteria

USSR/Medicine - Soil, Bacteriology May/Jun 48
Medicine - Bacteria
"The Role of Sporiferous Bacteria in Soil Processes,"
Ye. N. Mishustin, Inst Microbiol, Acad Sci USSR,
Moscow, 7 pp

2/19/70

2/19/70

MISHUSTIN, E. N.

PI 34/49T42

USSR/Medicine - Bacteria, Bac.
Longissimus
Medicine - Soil, Bacteriology

Nov/Dec 48

"Description of a New Species, Bac. Longissimus,"
E. N. Mishustin, E. Z. Tenner, Inst of Microbiol,
Acad Sci USSR, Chair of Plant Physiol and Microbiol,
Moscow Agr Acad imeni Timiryazev, 2 pp

"Mikrobiologiya" Vol XVII, No 6

Organism was isolated from seed-bed soil. It forms
long threads, hence the name. Describes microbe in
detail, with sketch.

34/49T42

MISHUSTIN, YE. M.

42176. MISHUSTIN, YE. M., TEMER, YE. Z. - Opisanie novogo vida bakterii *Vas. longissima*.
Mikrobiologiya, 1948, VYP. 4, s. 613-11.

SO: Letopis' Zhurnal'nykh Statey Vol. 47, 1948

MISHUSTIN, Yevgeniy N.

"Ecologico-Geographic Changes of Soil Bacteria," Sov. Knigs., Moscow, 1948

"Zonality and Its Manifestation in the Microbiological Processes of the Soil,"
Priroda, No. 1, 1948.

"Review of V. O. Kalinenko's article, 'Heterotropic Bacteria as Nitrifiers'," Mikrobiol.,
17, No. 6, 1948.

"Effect of Flowing on the Activity of Soil Microflora," Sov. Agroninya, No. 3, 1948,
pp. 65-72.

"Fat Decomposition Products Inhibit Alcoholic Fermentation," with V. L. Kretovich and
A. A. Bundel (SO: W-194, 5 Feb 48)

MISHUSTIN, E. N.

FA 16T17

USSR/Medicine - Bacteria - Culture
Medicine - Urine - Bacteria

Mar 1947

"Carbon Nutrition of Urobacillus," E. N.
Mishustin, Institute of Microbiology of the
Academy of Sciences, 4 pp

"Mikrobiologiya" Vol XVI, No 3

Description of Urobacillus, and its cultivation
in various media, notably in the presence of
peptone.

16T17

MISHUSTIN, YE. N.

Science

Ecological and geographical variability of soil bacteria. Moskva, izd-vo Akademii nauk SSSR, 1947.

Monthly List of Russian Accessions, Library of Congress, June 1952 UNCLASSIFIED.

MISHUSTIN, E. N.

MISHUSTIN, E. N. KRETOVICH, V. L. , and BUNDEL', A. A. "Fermentative Test as a Method
of Diagnosing Toxicity of Grain," in Reports of the Scientific-Research Work for 1945,
Department of Biological Science, Publishing House of the Academy of Science USSR, Moscow,
1947, p. 150. 511 Ak144

Sira-Si-90-53, 15 Dec. 1953

MISHUSTIN, E. N.

"Geographical variation of soil micro organisms." (p. 337) by Mishustin, E. N.

SO: Advances in Modern Biology (Uspekhi Sovremennoi Biologii) Vol. XXII, No. 3, 1966.

MISHUSTIN, YU. N. "Distribution of variants of *Bacillus mycoides* in soils of the Soviet Union."

The study of a considerable number of soil samples has shown that in the Northern zone (in tundra soils and peatsoils) the usual *Bac. mycoides* variants with white and pink heads are the most frequently encountered. In the steppe zone (in chestnut, brown and brown soils) the variants in folds with yellow and pink heads prevail.

In the Northern steppe zone and chernozem-like mountain soils *Bac. mycoides* variants with heads in the shape of elliptically curved bands prevail. In the Southern steppe and mountain-steppe soils contain the form of *Bac. mycoides* typical of the Northern zone.

In the soils of the desert zone (sierozems) various forms of *Bac. mycoides* are encountered, among which the desert variants are frequent.

Thus, with the transition from one climatic zone to another, the ecological forms of *Bac. mycoides* characteristic of the first zone are substituted by others.

The diagnosis of the forms of *Bac. mycoides* was performed on a special medium prepared by the author.

(From *Mikrobiya SSSR*, Vol IV, No 5, 1946)

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																																																																													
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Activity of catalase of <i>Bacillus mycoides</i> according to geographic source. B. N. Mishustin and V. K. Mishustina (Inst. Microbiol., Moscow). <i>Microbiologiya</i> 15, 285-6 (1946).—Strains of <i>B. mycoides</i> from Igarka, Savtykvar, Solikamsk, Moscow, Ryazan, Sum, Rostov, Krasnodar, Golodnaya Steppe, Samarkand, and Tbilisi were grown on meat-peptone-agar medium (3% peptone) for tests of catalase activity (I). Effects of growth rate, cell count, temp., and source were studied. As growth proceeds I decreases, dropping sharply at the spore-forming stage. From 20 to 35° I is nearly const.; at 42° it is very low. Cell count variations have only slight influence. Geographical source is influential; I decreases steadily from north to south. The test for I was liberation of O from H₂O₂. No. 4 Julian F. Smith																																																																																																							
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No. 3

Stability of soil macroaggregates formed by micro-organisms. E. N. Mishustin and E. P. Granyko (Inst. Microbiol., Moscow). *Mikrobiologiya* 15, (1969-73) 10461; cf. C. I. 36, 30651. Bacterial shimes and myceliums of *Actinomyces* also act to break down the aggregates. Cultures of *Stachybotrys*, *Fusarium*, *Trichoderma lignorum*, *Aspergillus glaucus*, *Penicillium glaucum*, *Hactomium* and *Mucor* in sterilized soils (contg. 1% sugar) were tested with soil aggregates. *Hactomium* and a few non-sporogenic fungi in which autolysis is feeble have only slight effects. The disaggregating action varies widely according to conditions; in general, 30-90% of the aggregates are broken down in 30 days. *Actinomyces griseus* broke down 71.4% of aggregates in 11 days in soil contg. 0.1% sugar (48.6% with 1% sugar), whereas *A. coelicolor* broke down only 36 and 3.5%, resp. Sometimes mycelial connective substance stabilizes aggregates by aiding their conversion to difficultly mineralized humus. Soil compn. is decisive in these cases. Aggregates formed with bacterial shimes are readily susceptible to bacterial breakdown (e.g. by *Radiobacter*, *Azotobacter chroococcum*, *B. macerans*, and *Cytophaga*), but are greatly stabilized by a little toluene. Stabilization by toluene is much weaker in aggregates formed with mycelial substance. Julian F. Smith

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MISHUSTIN, YE. N.

(Coauthor MIRZOYEVA, V. A.) "Relation of natural variants of bacillus mycoides to sources of their carbon nutrition"

00115-118

The authors studied the relation of two species of bacilli, isolated from natural sources, to the sources of their carbon nutrition. It was found that the strains of bacillus mycoides differed so greatly in their development according to the sources of their carbon nutrition, as to make it possible to divide them into two groups. However, all the strains showed a certain degree of adaptation towards the sources of their carbon nutrition, which was strictly indicated by the results of the experiments. It is concluded that, to a slight extent, more

the results make the conclusion that the complex of fermentative properties of the natural variants of bac. mycoides varies under the influence of the environment more than the other properties of the microbial cell.

(From Mikrobiologicheskii Zhurnal, Vol IV, No 2, 1964)

In the course of the present study, cell measurements were carried out on a representative sample of *Bac. sporobes* strains isolated from soils from various parts of the USSR. The results obtained permit the following conclusions:

1. Staining changes the width of the cell considerably. Consequently, only living cells were measured in the course of this study. The measurements were taken by means of an ocular micrometer.

2. In the course of the ageing process, the cells of every variety of *Bac. sporobes* become considerably thicker.

3. Investigating the changes experienced by the cell during ontogenesis, the authors have maintained that the different variants of *Bac. sporobes* differ in the width of their cells. The variants encountered in the work (part the common and the angular-rugose ones) are the common and the common form (generally rugose and elliptical) follow next. The thickest are the cells of the smooth forms of *Bac. sporobes*. The numerical ratio between the transverse diameters of the chief forms of *Bac. sporobes* approaches 1.15 - 1.16.

4. The authors are inclined to explain the increase on the cell surface of the common forms of *Bac. sporobes* as an adaptation that helps them to assimilate oxygen, which is relatively less soluble in water at higher temperatures.

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wt.) is introduced into the yeast culture (the medium being per ml.) in physiol. soln., the nutrient medium being most conveniently sugar; the tubes are incubated 2 days at 28° and the vol. of evolved gas is measured.

G. M. Kosolapoff

G. M. Kosolapoff

MISHUSTIN, YE. N.
(Coauthor, MIRZOYEVA, V. A.,) "Size of cells of natural variants of bac. Mycoidea
flueggei" Mikrobiol. Vol. 17#1, 1946 pp 3-12

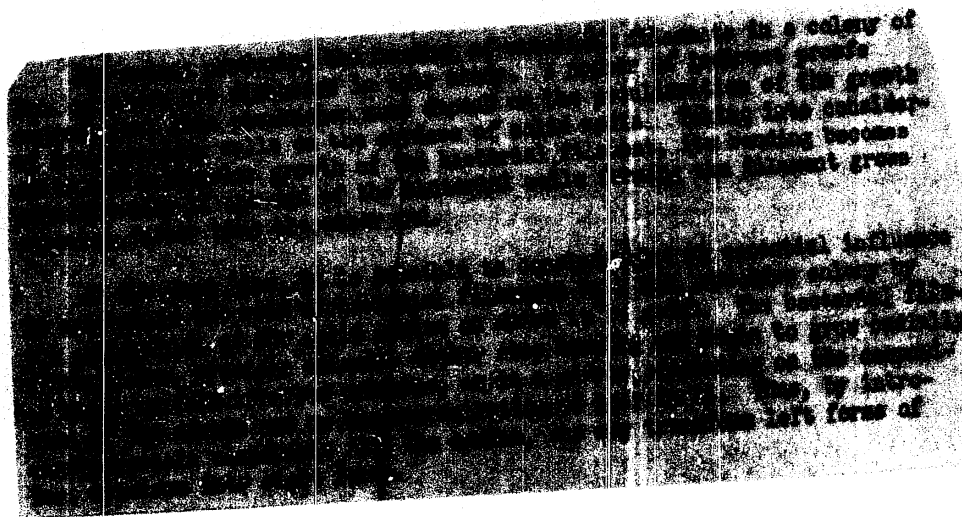
5. In the course of the present study, soil measurements were carried out in the same manner as the previous studies, and the results are reported in the following table.

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1ST AND 2ND COLUMNS 3RD AND 4TH COLUMNS																									
PROCESSING AND PROPERTIES INDEX CA NO. 2 Inhibition of alcoholic fermentation by fat decomposition products. V. L. Kretovich, E. N. Mishustin, and A. A. Bundel (Bach Biochem. Inst., Moscow). <i>Bio-khimiya</i> 11, 140-54(1946); cf. <i>C.A.</i> 30, 5344. -Alc. fermentation is inhibited by the oil extd. from "toxic" millet, wheat, and rye (grain which had lain in the field all winter and which causes "septic angina"). Fat decompn. products are responsible for this powerful physiol. effect. The oil from grain affected by molds did not inhibit alcoholic fermentation. H. Priestley																									
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MISHUSTIN, YE. N.
(Coauthor, BUKANOVA, V. I.) "Orientation of bacterial filaments in *Bacillus mycoides* colonies."

pp 86-92



over

MISHUSTIN, YE. N.

"Energy of Reproduction in Geographical Strains Bac. Mycoides (Fluegge), Mikrobiol., Vol. 13, No. 1, 1944, (Inst. Micro., Acad. Sci., -1944-)

"Succession of Microflora Accompanying the Process of Decomposition of Organic Remains as Connected with the Development of Bacillus Mycoides Flugge in Soils," Mikrobiol., Vol. 13, No. 6, 1944.

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										3RD AND 4TH ORDERS									
CA										<i>Chondrococcus coraloides</i> (Thaxter) and factors influencing the cycle of its development. E. N. Mishustin. <i>Microbiology</i> (U. S. S. R.) 11, 178-84(1942)(English summary).--The isolated and investigated species <i>Chondrococcus coraloides</i> does not show the same rate of development on different media. On media deficient in org. matter the <i>Myxococcus</i> soon forms fruiting bodies. The addn. to this medium of C-contg. org. substance (carbohydrates) inhibits the development cycle of the <i>Myxococcus</i>. In this case the addn. of 0.02-0.5 mg. of heterococci. In this case the rate of fruiting body formation. This latter action is specific so that it would seem possible to use this <i>Myxococcus</i> culture in a simple test to det. the presence of growth substances of the heterococci type.										112									
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6A

Role of the microbiological factor in the formation of soil structure E. N. Mishustin and O. I. Pushkinekaya. *Microbiology* (U. S. S. R.) 11, 92-101 (1942) (English summary); cf. *Ibid.* 10, 342 (1941) and *C. A.* 36, 7207.

The study of pure cultures of microorganisms for their capacity to aggregate soil has shown that this process is most readily accomplished by fungi and actinomycetes, i. e., by microorganisms possessing myceliary growth. Bacteria forming mucus will not aggregate the soil unless in the presence of considerable amts. of easily available carbohydrates. Thus it is concluded that bacteria normally have a lesser significance in forming soil structure than fungi and actinomycetes. Some fungi produce a considerable aggregation of the soil even in the presence of very small amts. of available org. matter. In mixed cultures the bacteria sharply decrease the structure-forming action of fungi and actinomycetes. This can be explained both by growth depression of the latter organisms as well as by destruction of the cementing action of the latter organisms by the bacteria. In soils richer in finely dispersed parts (colloids and silts) there is observed a much better structural formation of the soil from the first stages of disintegration of the org. matter. The "biological" soil structure set up by microorganisms differs from the structure created by humus substances, and is considered the first stage in the structural formation of soil under natural conditions. The more mobile part of soil structure is destroyed by keeping it in a thermostat at 25° for a month.

E. Leverne Williams

ASH-S-4 METEOROLOGICAL LITERATURE CLASSIFICATION

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U. S. S. R.

84

14

Distribution of *Bacterium mycoides* Flugge in soils of various types. E. N. Mishustin and O. I. Pushkinskaya. *Microbiology* (U. S. S. R.) 10, 439-51 (in English, 455) (1941). Tests of soils for *B. mycoides* content in various parts of the U. S. S. R. led to the conclusion that the main factor for its development is easily decompd. org. compds. in the soil. Podzols contained mostly *R* forms, while the gray soils of st. pps contained *S* forms. The *S* forms cultivated on meat-peptone agar are transformed into *R* forms when raised on potato agar. This fact can be used for diagnostic purposes, since reculturing on meat-peptone agar will cause a return to the initial form. For analysis of gray soil potato agar proved best, and favorable results were obtained by placing small clods of soil directly on the agar plate instead of using the diln. method. T. L.

MISHUSTIN, YE. N.

"The Fungus of the Genus Monilia Responsible for the Bluing of Macaroni during Drying," Mikrobiol., 9, No. 1, 1940.

Soil acidity as a factor determining the occurrence of inactive Azotobacter in the soil. II. Experimental production of inactive forms of Azotobacter. (U. S. S. R.) 8, 1063 and Z. I. Bakhareva. *Microbiology* (U. S. S. R.) 36, 765 (1940) (English, 1971 2) (1940). (U. S. S. R.) 36, 765 (1940) (English, 1971 2) (1940). After a few days in acid soil I does not develop on gel media but colonies appear on soil plates contr. N compds. Prolonged culturing on a mannitol medium partially restores the N-fixing capacity of I.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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The soil acidity as a factor which determines the appearance of the inactive azotobacter in the soil. E. N. Mikhustin and M. I. Semenovich. *Microbiology (USSR)*, No. 8, No. 1, 1939(1939); *Rhim. Referat Zhur.* 1939, No. 11, 51. The cultivated podzol soils are very rich in azotobacter. Chernozems (fertilized as well as unfertilized) also contain azotobacter, but none was found in the virgin Gamskii chernozem soil. Azotobacter colonies did not grow on siliceous earth plates if the pH of the soil was below 5.0. Inactive azotobacters were detected by the method of soil plates. The increased exchange acidity of the soil is one of the factors causing the inactivation of azotobacter. The appearance of the nutritive substances is not related to the content of the nutritive substances in the soils. The more acid the soil is the greater is the effect on the growth of the azotobacters of the addition of the soil of CaCO_3 and of phosphates in the preparation of soil plates. W. R. Thom

METALLURGICAL LITERATURE CLASSIFICATION

12

CP

The formation of humus-like compounds during autolysis. E. N. Mishustin and O. P. Polyakovskaya. *Microbiology* (U. S. S. R.) 7, 198 217 (1968); *Chem. Zentr.* 1969, 1, 1385. It was shown experimentally that humus-like substances were formed in rye and wheat grains which had been kept in moist condition for a long time in a 30-40° thermostat. Aeration considerably accelerated the process. Temps. up to 70° had a similar effect, while higher temps. had an opposite effect, which is explained as due to the destruction of the activity of the enzymes which are responsible for the autolysis. The humic acid isolated from the grains contained about 2-3% N. M. G. Moore.

ASAC-SLR METALLURGICAL LITERATURE CLASSIFICATION

CA

11C

Cellulose-decomposing myzobacteria. E. N. Mishustin. *Microbiology* (U. S. R. R.) 6, 1275-1276 (1937); *Chem. Zentr.* 1938, II, 704-5.—The compn. of the cellulose-decomp. flora in soil is closely connected with the agricultural treatment of the soil. In well worked soils *Cytophaga* and a green *Vibrio* are well represented, in underworked soils myzobacteria and fungi are predominant; while in poorly tilled soils the fungi flora predominate entirely. Most cellulose-decomp. myzobacteria belong to the genus *Polyomyxium*. W. A. Moore

450.51.4 METALLURGICAL LITERATURE CLASSIFICATION

RECORD NO. 11111

11111